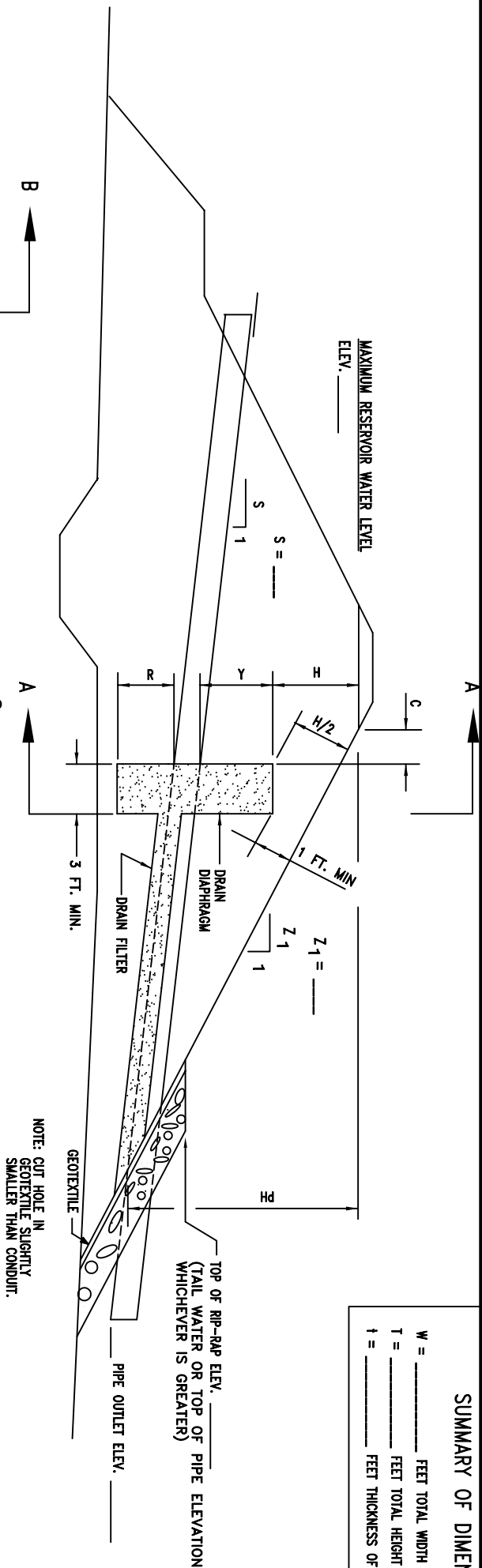


MAXIMUM RESERVOIR WATER LEVEL  
ELEV. \_\_\_\_\_



**SUMMARY OF DIMENSIONS**

W = \_\_\_\_\_ FEET TOTAL WIDTH OF DRAIN DIAPHRAGM  
T = \_\_\_\_\_ FEET TOTAL HEIGHT OF DRAIN DIAPHRAGM  
t = \_\_\_\_\_ FEET THICKNESS OF SINGLE FILTER

**SUMMARY OF DESIGN**

H = \_\_\_\_\_ FEET      Hd = \_\_\_\_\_ FEET  
X = \_\_\_\_\_ FEET      D = \_\_\_\_\_ FEET  
R = \_\_\_\_\_ FEET      Y = \_\_\_\_\_ FEET  
C = \_\_\_\_\_ FEET  
BEDROCK AT ELEVATION \_\_\_\_\_

**ESTIMATED QUANTITIES**

DRAIN FILTER MATERIAL \_\_\_\_\_ CUBIC YARDS  
GEOTEXTILE \_\_\_\_\_ SQUARE FEET  
RIP-RAP \_\_\_\_\_ CUBIC YARDS

**DRAIN FILTER GRADATION**

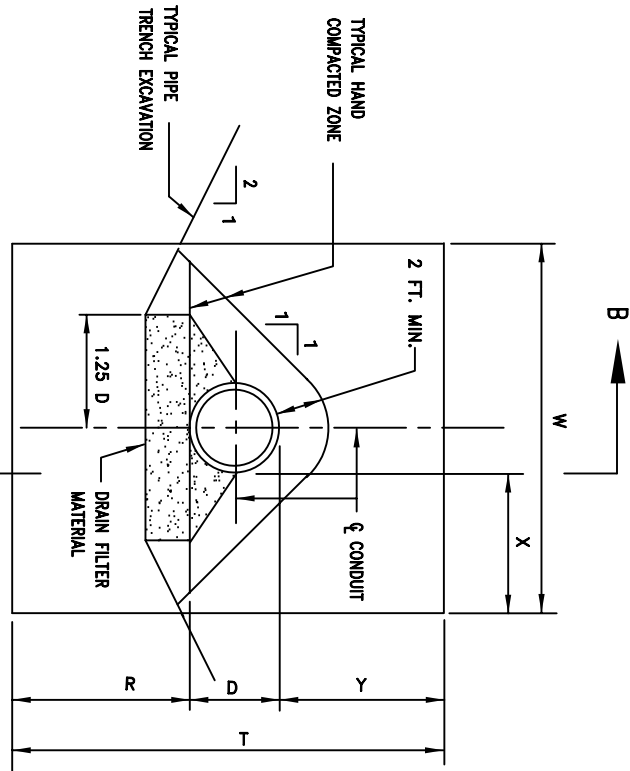
| SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 3/8        | 100             |
| 4          | 95-100          |
| 16         | 45-85           |
| 50         | 5-30            |
| 100        | 0-10            |

**RIPRAP GRADATION**

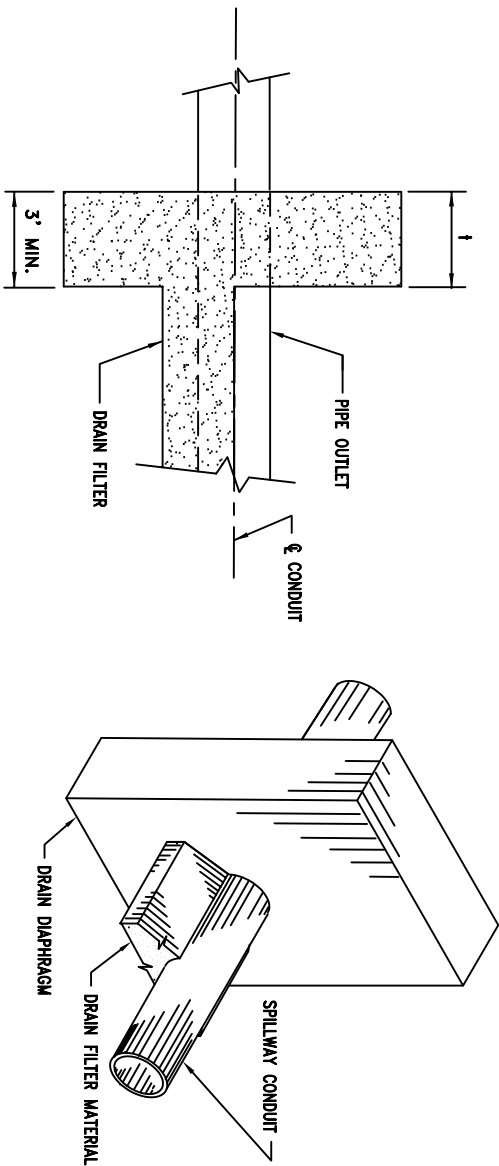
| PERCENT SMALLER | WEIGHT RANGE (LBS.) | SIZE RANGE (IN.) |
|-----------------|---------------------|------------------|
|                 |                     |                  |

ASTM, C-33 FINE AGGREGATE  
MNDOT 3126 FINE AGG  
MNDOT 3127 FA-1

MIN. GRADATION  
MNDOT CLASS II



**SECTION B-B**



**PARTIAL ISOMETRIC**  
SHOWING CONDUIT, DRAIN DIAPHRAGM, & DRAIN FILTER MATERIAL

**MATERIAL NOTE**

THE GEOTEXTILE SHALL CONFORM TO THE CLASS I REQUIREMENTS IN TABLE 1 (WOVEN) OR TABLE 2 (NONWOVEN) MATERIAL SPECIFICATION 592, EXCEPT THE POA OF THE WOVEN SHALL BE GREATER THAN 6%, AND THE POROSITY OF THE NONWOVEN SHALL BE GREATER THAN 30%.

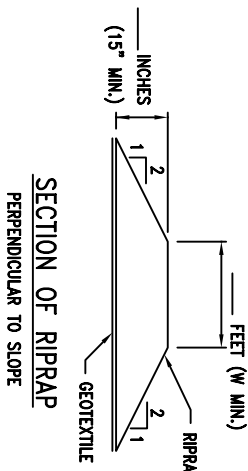
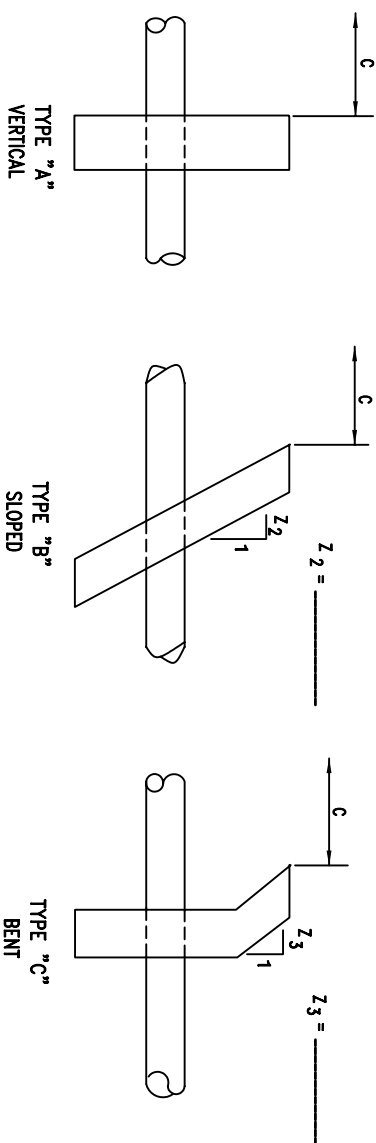
**DEFINITIONS**

D = OUTSIDE DIAMETER OF CIRCULAR CONDUIT  
H = VERTICAL DISTANCE BETWEEN THE TOP OF THE DIAPHRAGM AND THE MAXIMUM POTENTIAL RESERVOIR WATER LEVEL.  
X = FOR FLEXIBLE CONDUITS USE THE SMALLER OF 2D OR 5 FEET BEYOND ANY EXCAVATION MADE TO INSTALL THE CONDUIT. FOR RIGID CONDUIT (CONCRETE) USE THE SMALLER OF 3D OR 5 FEET BEYOND ANY EXCAVATION MADE TO INSTALL THE CONDUIT.  
Y = VERTICAL DISTANCE FROM TOP OF CONDUIT TO TOP OF DIAPHRAGM  
Y = 2D or no higher than maximum potential reservoir water level  
C = HORIZONTAL DISTANCE FROM D.S. FACE AT MAXIMUM POTENTIAL RESERVOIR WATER LEVEL TO U.S. FACE OF DIAPHRAGM  
R = 2D OR NOT TO EXTEND BEYOND A BEDROCK SURFACE  
Hd = VERTICAL DISTANCE FROM MAXIMUM POTENTIAL RESERVOIR WATER LEVEL TO CONDUIT INVERT AT D.S. FACE OF SLOPE  
S = SLOPE OF CONDUIT IN FEET OF FALL PER HORIZONTAL FOOT  
$$C = Hd * Z_1 - \frac{((1.5 * D) + (Hd / 2))}{(1 / Z) - (S / 2)} > 0 \quad (\text{MAXIMUM})$$

**CONSTRUCTION NOTES:**

1. NO COMPACTION OF THE DRAIN FILTER MATERIAL IS REQUIRED BEYOND THAT RESULTING FROM THE PLACING & SPREADING OPERATIONS. THE DRAIN FILTER MATERIAL SHALL BE PLACED IN 12 INCH LIFTS. EACH LIFT SHALL BE SATURATED UNIFORMLY WITH APPROXIMATELY 1.2 GALLONS OF WATER PER CUBIC FOOT OF LOOSE DRAIN MATERIAL.
2. THE MAXIMUM HEIGHT OF DROP OF THE RIPRAP ONTO THE GEOTEXTILE SHALL BE 3 FEET.

**DRAIN DIAPHRAGM CONFIGURATIONS**



**DRAIN DIAPHRAGM LAYOUT FOR HOOD-INLET & DRAIN FILTER**



| DATE | REVISIONS | BY |
|------|-----------|----|
|      |           |    |
|      |           |    |
|      |           |    |

File No. MN301c.DWG  
Drawing No. MN-ENG-301c  
5/02

Sheet of

Date \_\_\_\_\_  
Designed \_\_\_\_\_ (3-89)  
Drawn CADD (RCG)  
Checked (MAP) (JAA) (1-94)  
Approved \_\_\_\_\_